

GRANTSVILLE RESERVOIR



Introduction

Grantsville Reservoir is an intermediate size reservoir at the base of the Stansbury Mountains in western Utah. It is an unusual reservoir in that it is not built in a valley, but is a horseshoe-shaped dam on an alluvial slope. This type of impoundment can be build anywhere, but it requires a tremendous amount of material. Grantsville

Reservoir is an off-stream impoundment of several streams on the east slopes of the Stansbury Mountains. It was created in 1984 by the construction of the horseshoe-shaped earth-fill dam. The reservoir shoreline is privately owned, and public access is unrestricted. Reservoir water is used for irrigation, and recreation with no changes foreseen. Water is released from the reservoir into canals for agricultural purposes.

Characteristics and Morphometry

| | |
|--|---------------------------------|
| Lake elevation (meters / feet) | 1,532 / 5,026 |
| Surface area (hectares / acres) | 35.6 / 88 |
| Watershed area (hectares / acres) | 777.3 / 1920 |
| Volume (m ³ / acre-feet) | |
| capacity | 4.157 x 10 ⁶ / 3,370 |
| conservation pool | 617,000 / 500 |
| Annual inflow (m ³ / acre-feet) | 3.54 x 10 ⁶ / 2,870 |
| Retention time (years) | 1.2 |
| Drawdown (m ³ / acre-feet) | 13 / 43 |
| Depth (meters / feet) | |
| maximum | 19 / 63 |
| mean | 15 / 50 |
| Length (meters / feet) | 1,000 / 3,300 |
| Width (meters / feet) | 550 / 1,800 |
| Shoreline (km / miles) | 2.6 / 1.6 |

Location

| | |
|-----------------------------------|--------------------------------|
| County | Tooele |
| Longitude / Latitude | 112 30 13 / 40 32 32 |
| USGS Map (Reservoir not on map) | North Willow Creek 1985 |
| DeLorme's Utah Atlas & Gazetteer™ | Page 52 C-2 |
| Cataloging Unit | Rush/Tooele Valleys (16020304) |

Recreation

Grantsville Reservoir is accessible from the Grantsville-Rush Valley Road, a paved road running south from Grantsville along the west side of the Tooele Army to St. John and U-199 in Rush Valley. North Willow [C r e e k] R o a d

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(gravel) runs due west from the Grantsville-Rush Valley Road, 4 miles south of U-138 in Grantsville and about 1.3 miles north of South Willow [Creek] Road. Grantsville Reservoir is 1/2 miles west of the intersection and 1/4 mile south of North Willow Road.

Fishing is the only recreational use of the reservoir. Although the reservoir has a maximum depth of 19 meters, there is usually a 20 foot deep pool that remains throughout the year, to provide for fish habitat. Gas powered boats are not allowed on the reservoir, but electric boats are permitted. The reservoir has no particular scenic value, although the Stansbury Mountains provide a spectacular backdrop.

Tooele County built a campground immediately west of the reservoir in the summer of 1993. They have 10 acres of land with trees and privies. The campground is accessible from North Willow Road.



There are also some USFS campgrounds in South Willow Creek, including South Willow Campground, Lower Narrows and Upper Narrows and North Willow Canyon.. South Willow Canyon is the primary trailhead for hiking in the Deseret Peak Wilderness Area, part of the Grantsville Reservoir watershed.

Watershed Description

Grantsville Reservoir is an off-stream impoundment on the east face of the Stansbury Mountains. The reservoir is located about a mile east of the base of the mountains on a sloping alluvial plain (made up of sediments carried out of the mountains during heavy rains). The streams begin in high mountains, where the watershed is part of the Deseret Peak Wilderness. The headwaters were glaciated, and now contain several cirque lakes. The natural flow of the streams is to cascade down the mountainsides and out onto the alluvial plains, where they evaporate and are soaked into the ground. Grantsville Reservoir was constructed to capture the stream water before it soaks into the ground, and store

it for agricultural uses. The clear mountain streams are piped from the diversions to the reservoir. There is also a small natural watershed of the lower foothills and alluvial slopes, but this watershed only contributes runoff in heavy rains.

The watershed high point, Deseret Peak, is 3,362 m (11,031 ft) above sea level, thereby developing a complex slope of 16.7% to the reservoir. The inflows, from north to south, include Davenport Creek (piped from the National Forest boundary), North Willow Creek (piped from the National Forest Boundary), Left Fork North Willow Creek (piped from about 7,500 elevation), Miners Fork and South Willow Creek (each piped from shortly above their confluence), and Box Elder Creek (piped from the alluvial slopes). The average stream gradient above the pipe intakes is 14% (739 feet per mile). The outlet is an irrigation pipe or canal.

The watershed is made up of high mountains, barren outcroppings and alluvial plains. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities have not been determined, but probably consist of sagebrush-grass, pinyon-juniper, oak-maple, spruce-fir, pine, aspen, and alpine. The watershed receives 30 - 102 cm (12 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 160 -180 days per year.

Land use is native grazing on the private lands (about 15%), and multiple use on the BLM and USFS lands (about 85%). The area above the reservoir is used for intensive recreation, and the high mountains are also used for recreation.

Limnological Assessment

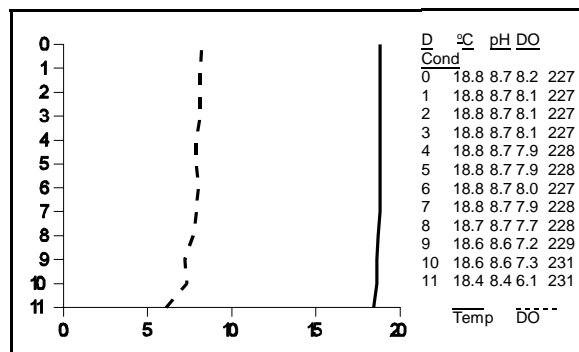
The water quality of Grantsville Reservoir is very good.

It is considered to be moderately hard with a hardness concentration value of approximately 109 mg/L (CaCO₃). The only parameter that has exceeded State water quality standards for defined beneficial uses is phosphorus. Although the average concentration of total phosphorus in the water column in 1989 and 1991 was 14.1 and 21.5 ug/L which does not exceed the recommended pollution indicator for phosphorus of 25 ug/L, the phosphorus concentration in the epilimnion in August, 1991 reached a level of 35 ug/L. It is apparent that the overall concentration of total phosphorus in the reservoir is having no impact on its defined beneficial uses. Dissolved oxygen concentrations in late summer are relatively good throughout the water column and indicate no water quality impairments exist. The reservoir has been characterized as a nitrogen limited system. The reservoir is currently fairly productive. This is not atypical for newly created reservoirs which usually exhibit a fairly high state of production during the period immediately after

LAKE REPORTS

| Limnological Data | | | |
|---------------------------------------|-------|-------|--|
| Data sampled from STORET site: 596087 | | | |
| Surface Data | 1989 | 1991 | |
| Trophic Status | M | M | |
| Chlorophyll TSI | 45.57 | 50.43 | |
| Secchi Depth TSI | 40.76 | 45.42 | |
| Phosphorous TSI | 44.57 | 51.41 | |
| Average TSI | 43.63 | 49.08 | |
| Chlorophyll <i>a</i> (ug/L) | 4.6 | 7.5 | |
| Transparency (m) | 3.8 | 2.75 | |
| Total Phosphorous (ug/L) | 17 | 27 | |
| pH | 8.4 | 8.6 | |
| Total Susp. Solids (mg/L) | <3* | 8.0 | |
| Total Volatile Solids (mg/L) | - | 8.0 | |
| Total Residual Solids (mg/L) | - | 7 | |
| Temperature (°C / °f) | 15/59 | 16/60 | |
| Conductivity (umhos/cm) | 295 | 256 | |
| Water Column Data | | | |
| Ammonia (mg/L) | 0.64 | 0.03 | |
| Nitrate/Nitrite (mg/L) | - | 0.24 | |
| Hardness (mg/L) | 103* | 115 | |
| Alkalinity (mg/L) | 99* | 104 | |
| Silica (mg/L) | - | 7.0 | |
| Total Phosphorus (ug/L) | 15 | 22 | |
| Miscellaneous Data | | | |
| Limiting Nutrient | P | N | |
| DO (Mg/l) at 75% depth | 8.3 | 7.6 | |
| Stratification (m) | NO | NO | |
| Depth at Deepest Site (m) | 3.5 | 11.0 | |
| * Period 1 Data Only | | | |

impoundment. TSI values indicate the reservoir is mesotrophic. Being a new reservoir it will be necessary to obtain more data to determine the long term trend information for the reservoir. No stratification was present during regularly scheduled monitoring trips. The August 6, 1991 profile indicate that the temperature of the water column was uniform from top to bottom with an average



temperature of 18-19 degrees C and that an adequate concentration of dissolved oxygen was present to sustain a viable fishery. According to DWR no fish kills have been reported in recent years.

The DWR stocks the reservoir with about 12,000 catchable Rainbow Trout in the spring and 1,000 in the fall. The 20 foot depth (500 acre-feet) conservation pool allows fish to live in the reservoir year round.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

| Species | Cell Volume (mm ³ /liter) | % Density By Volume |
|----------------------------------|--------------------------------------|---------------------|
| <i>Fragilaria crotonensis</i> | 115.681 | 74.67 |
| <i>Sphaerocystis Schroeterii</i> | 26.410 | 17.05 |
| <i>Stephanodiscus niagarae</i> | | 12.671 |
| <i>Dinobryon divergens</i> | 0.125 | 0.08 |
| <i>Microcystis incerta</i> | 0.011 | 0.01 |
| <i>Ankistrodesmus falcatus</i> | 0.009 | 0.01 |
| Pennate Diatoms | 0.007 | 0.00 |
| Centric Diatoms | 0.003 | 0.00 |
| Total | 154.917 | |
| Shannon-Weaver Index [H'] | 2.73 | |
| Species Evenness | 0.35 | |
| Species Richness | 0.27 | |

There is a lot of flora diversity with diatoms and green algae dominating the phytoplankton community. They are also indicative of lower productive waters.

Pollution Assessment

Nonpoint pollution sources include grazing, unreclaimed mines, and recreation.

There is a problem with overgrazing upstream from the Box Elder Creek intake, resulting in silty, turbid water being piped into the reservoir. The irrigation company would like to solve this problem by moving the pipe intake up into the mountains.

Cattle graze heavily on the alluvial slopes, and use the reservoir as a source of drinking water. This results in nutrient loading, soil compaction and increased sedimentation, and is likely a primary cause of eutrophication in the reservoir.

There are no point sources of pollution in the watershed.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

| Information | |
|---|----------|
| Management Agencies | |
| Wasatch Front Regional Council | 292-4469 |
| Division of Wildlife Resources | 538-4700 |
| Division of Water Quality | 538-6146 |
| Recreation | |
| Great Salt Lake Country Travel Region (SLC) | 896-9222 |
| Tooele Chamber of Commerce | 882-0690 |
| Reservoir Administrators | |
| Grantsville Irrigation Company | 884-3451 |